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CARDIAC FUNCTION AND HEART FAILURE

IMPROVED RIGHT VENTRICULAR MYOCARDIAL PERFORMANCE DESPITE REDUCED LONGITUDINAL DEFORMATION AFTER LEFT VENTRICULAR ASSIST DEVICE IMPLANTATION IN PATIENTS WITH SEVERE HEART FAILURE

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Background: It is unclear how axial flow left ventricular assist devices (LVAD) modify right ventricular (RV) function. We hypothesized that RV myocardial performance index (RV MPI) as a marker of function improves after LVAD implantation secondary to favorable loading conditions independent of changes in RV longitudinal systolic deformation.

Methods: Echocardiography was performed in 29 consecutive patients both before and within 12 months after implantation of LVAD in patients with severe heart failure. Tricuspid annular plane systolic excursion (TAPSE) and annular systolic velocity (RV TDI Sa) were measured to assess RV longitudinal deformation. These were compared to RV MPI a Doppler based calculation in which lower values signify increased ventricular efficiency.

Results: RV longitudinal function was reduced whereas ventricular performance increased within the first year after LVAD implantation. This favorable effect matched improved clinical status assessed by New York Heart Association class of heart failure (Table 1).

Table 1. Measures of RV function and Patient clinical status before and after LVAD

	Pre LVAD	Post LVAD	P value
TAPSE (cm)	1.46+/-0.5	0.87+/-0.29	2.7x10-7 (n=25)
RV TDI Sa (cm/sec)	7.85+/-4.6	4.92+/-2.47	0.09 (n=13)
RV MPI	0.94+/-0.57	0.68+/-0.31	0.009 (n=29)
New York Heart Association Class<III (number of patients)	0	16	
Values are mean +/- 1 SD			

Conclusions: TAPSE and RV TDI Sa are not reliable markers of RV performance as axial flow disrupts normal longitudinal RV contraction. This is likely related to the reduced contribution of LV contraction to RV deformation. Assessment of RV MPI is a more comprehensive indication of RV function that reflects improved loading conditions and improved clinical status seen after LVAD implantation.